

The subgenus *Typhlodromalus* Muma of the genus *Amblyseius* Berlese in South Africa (Acarina: Phytoseiidae)

by

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INTRODUCTION

In a recent paper van der Merwe and Ryke (1963) give a cursory survey of the literature pertaining to the relationships between the predacious phytoseiids and the phytaphagous mites as well as a discussion of the key characteristics of the Phytoseiidae in general and the Amblyseiinae in particular. The reader is referred to the above-mentioned paper and to Muma (1961) for a definition of the genus *Amblyseius* Berlese and for a key to separate the subgenera.

The present study attempts a survey of the distribution and taxonomy of the members of the common phytoseiid subgenus *Typhlodromalus* Muma occurring on plants in South Africa. The authors hope that this may furnish a basis for subsequent research work on the ecology and possible utilization of these mites in the biological control of phytophagous Acarina.

The techniques employed in the study of the Phytoseiidae are discussed by van der Merwe *et al.* (1963). The type specimens which are in alcohol, are deposited in the collection of the Institute for Zoological Research of the Potchefstroom University. The authors are extremely grateful to Mr D. P. Annecke of the Division of Entomology, Pretoria, for his constructive advice and for reading the manuscript.

Genus *AMBLYSEIUS* Berlese, 1915

Subgenus *Typhlodromalus* Muma, 1961

The following key to the females of the new South African species of *Amblyseius* (*Typhlodromalus*) is based on the relative lengths of the dorsal (D), median (M) and lateral (L) setae on the dorsal shield and on the shape of the posterior margin of the sternal shield.

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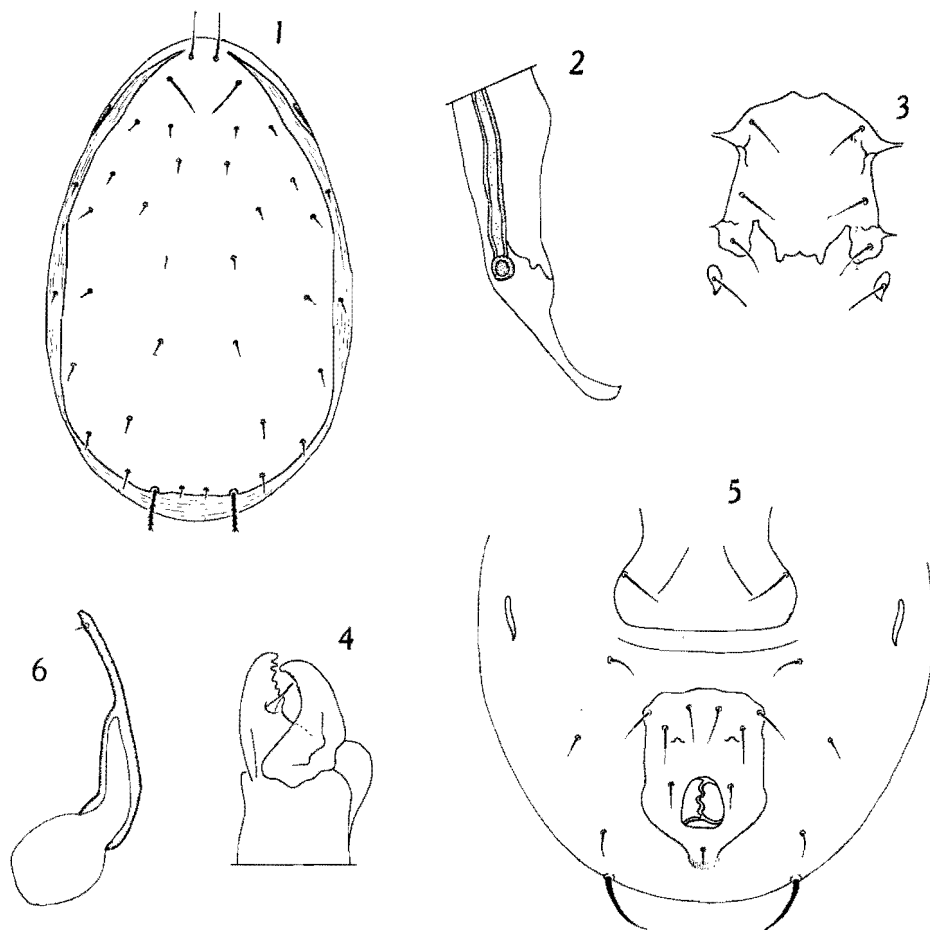
1. Seta L_4 shorter than seta L_8 2
- Seta L_4 longer than seta L_8 5
2. Seta L_8 longest seta on dorsal shield 3
- Seta D_1 longest seta on dorsal shield **grabouwensis**
3. Setae L_1 and D_1 equal in length 4
- Seta L_1 shorter than seta D_1 **rubicolus**
4. Seta D_1 shorter than seta L_4 **anneckeii**
- Setae D_1 and L_4 equal in length **raptor**
5. Seta D_1 shorter than seta L_1 6
- Setae D_1 and L_1 equal in length **citri**
6. Seta L_3 shorter than the distance between its base and that of seta L_4 posterior margin of lateral lobe of sternal shield smooth **addoensis**
- Seta L_3 in length equals the distance between its base and that of seta L_4 , posterior margin of lateral lobe of sternal shield undulate **undulatus**
- Seta L_3 greater in length than the distance between its base and that of seta L_4 7
7. Seta L_2 shorter than the distance between its base and that of seta L_3 **capensis**
- Seta L_2 greater in length than the distance between its base and that of seta L_3 8
8. Dorsal (D) setae relatively short, seta D_2 shorter than the distance between its base and that of seta D_3 **erugatus**
- Dorsal (D) setae relatively long, seta D_2 greater in length than the distance between its base and that of seta D_3 **transvaalensis**

A. (*Typhlodromalus*) *grabouwensis* spec. nov., figs. 1-6

This species differs from other members of the genus in that D_1 is the longest seta on the dorsum and seta L_8 is longer than L_4 . Posteriorly the median lobe of the sternal shield has two prominent lateral projections.

FEMALE: Dorsum (fig. 1): The smooth shield (length 346-350 μ ; breadth 210-222 μ) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follow: D_1 , 34-36 μ ; D_2 , 8 μ ; D_3 , 8 μ ; D_4 , 8 μ ; D_5 , 10-11 μ ; D_6 , 8 μ ; M_1 , 8 μ ; M_2 , 8 μ ; M_3 , 10-12 μ ; L_1 , 31-32 μ ; L_2 , 8 μ ; L_3 , 8 μ ; L_4 , 10-11 μ ; L_5 , 11-12 μ ; L_6 , 11-12 μ ; L_7 , 11-12 μ ; L_8 , 28-30 μ . Only setae D_1 , L_1 and L_8 are therefore of moderate length. All of them, however, are shorter than the intervals between those in the same series. The distal third of the stout seta L_8 is strongly pectinate. Setae S_1 and S_2 are placed on the interscutal membrane with S_2 at the same level as M_2 .

Venter: The sternal shield (fig. 3) is longer (78-80 μ) than broad (63-68 μ) and bears three pairs of setae. Posteriorly the median lobe has laterally two prominent projections. The lateral lobe has a pseudolobe and the incision narrows, ending angularly. The fourth pair of sternal setae are placed on oval, posteriorly pointed metasternal shields. The genital shield (fig. 5) is normal (width, 92-94 μ) and provided with a pair of seta. The ventri-anal



Figs. 1-6. *A. (Typhlodromalus) grabouwensis* spec. nov., female

Fig. 1. dorsum; fig. 2. peritrematal shield; fig. 3. sternal shield; fig. 4. chelicera; fig. 5. posterior venter; fig. 6. spermatheca.

shield (fig. 5) (length $92-97\ \mu$; breadth $66-69\ \mu$) has a sinuate anterior margin and parallel lateral margins. The shield, bearing three pairs of pre-anal setae and a pair of pores, bulges slightly across the lateral anterior pre-anal setae and the anus. It tapers to the level of the postanal seta. The para-anal setae are normal.

The ventral interscutal membrane flanking the ventri-anal shield bears a pair of slender metapodal shields and four pairs of setae, one pair (VL_1) being long ($40\ \mu$) and curved. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 1) and curve posteriorly around coxae IV, ending

in a sharp point (fig. 2). The peritreme reaches anterodorsally to a position near the level of seta L_2 .

Spermathecae (fig. 6): Due to its unusual shape the spermatheca (length $44\ \mu$) is difficult to trace in the unflattened body. The duct is extremely short and the neck portion, with the very small lips, is scarcely, if at all, bulged. The lateral margins of the shank run parallel for nearly one-half of its length and then seem to branch, thus forming a peculiarly shaped, elongate bell.

Chelicerae (fig. 4): The fixed digit (length $25\ \mu$) of the chelicera bears five prominent teeth and a pilus dentilis. The movable digit. (length $27\ \mu$) is slightly denticulate at the inner distal third.

Legs: Leg IV bears three macrosetae, the one on the genu being $38-39\ \mu$ in length, on the tibia $35-36\ \mu$ and on the basitarsus, $45-46\ \mu$. The other legs are normal.

MALE: Unknown.

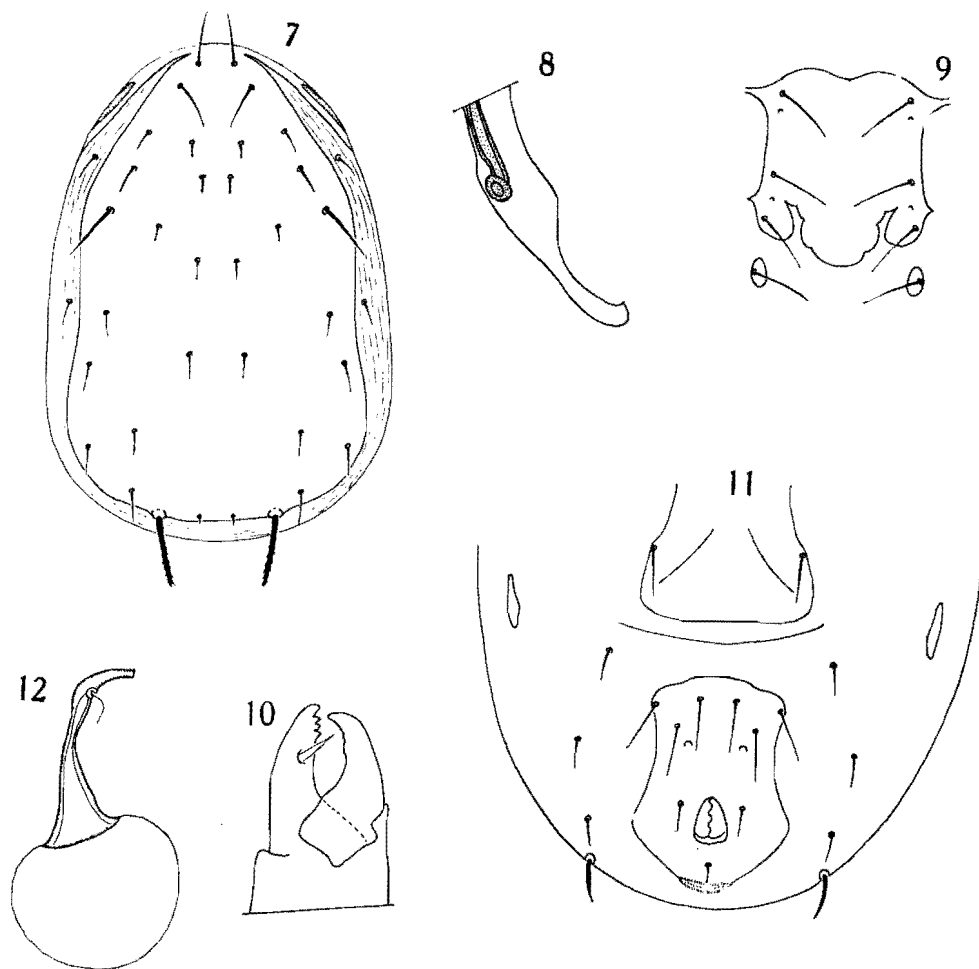
REMARKS: This species resembles *A. (T.) newsami* (Evans) in many respects. L_1 is moderately long in both species; the ventri-anal shield, however, is without a prominent waist in *grabouwensis*.

MATERIAL STUDIED: ♀ - Holotype (serial no. 33/13/58/1) and one ♀ - paratype from leaves of *Passiflora* species, Grabouw (C.P.), 17.XI.1953 (P. A. J. Ryke).

A. (Typhlodromalus) rubicolus spec. nov., figs. 7-12

This species differs from other members of the genus in that L_8 , the longest seta on the dorsum, is longer than seta L_4 and seta D_1 is longer than L_1 . The median lobe of the sternal shield is scalloped whereas the lateral lobes are smooth.

FEMALE: *Dorsum* (fig. 7). The mildly imbricate shield (length $375\ \mu$; breadth $233-240\ \mu$) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , $39-41\ \mu$; D_2 , $9-10\ \mu$; D_3 , $9-10\ \mu$; D_4 , $13-14\ \mu$; D_5 , $15-16\ \mu$; D_6 , $6-7\ \mu$; M_1 , $9-10\ \mu$; M_2 , $15-16\ \mu$; M_3 , $15-16\ \mu$; L_1 , $34-36\ \mu$; L_2 , $13-14\ \mu$; L_3 , $19-20\ \mu$; L_4 , $44-45\ \mu$; L_5 , $19-20\ \mu$; L_6 , $20-21\ \mu$; L_7 , $22-23\ \mu$; L_8 , $52-55\ \mu$. Setae D_4 and L_2 are of equal length and slightly shorter than D_5 , M_2 and M_3 . Setae L_3 and L_5 are of equal length and a little shorter than L_6 , whilst L_6 is a little shorter than L_7 . Setae L_4 and L_7 are longer than the distance between bases L_4 and L_3 , and L_7 and L_8 respectively. L_1 , L_2 and L_3 are shorter than the distances to the bases of the setae next following in the series. The stout and faintly pectinate setae L_8 are much shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies a little anterior to M_2 .



Figs. 7-12. *A. (Typhlodromalus) rubicolus* spec. nov., female

Fig. 7. dorsum; fig. 8. peritrematal shield; fig. 9. sternal shield; fig. 10. chelicera; fig. 11. posterior venter; fig. 12. spermatheca.

Venter: The sternal shield (fig. 9) (length $85-90\ \mu$; breadth $72-74\ \mu$) bears three pairs of setae. The median lobe is scalloped and the lateral lobes are smooth. The incision cuts into the lateral lobe with a sharp angle. Sternal setae IV are situated on oval metasternal shields. The genital shield (fig. 11) is normal (width $93-95\ \mu$) and provided with a pair of setae. The ventri-anal shield (fig. 11) is longer ($112-115\ \mu$) than broad ($76-80\ \mu$) with its anterior margin curved and recurved anteriorly. The lateral margins are gently constricted leaving the broadest part of the shield across the anus. Three pairs

of preanal setae and a pair of pores are grouped anteriorly on the shield. The normal para-anal setae are present. The ventral interscutal membrane, flanking the ventri-anal shield, is provided with four of setae, one pair (VL_1) being long ($34\ \mu$) and slightly curved. One pair of metapodal shields is present. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 7) and curve posteriorly around coxae IV, ending bluntly (fig. 8). The peritreme reaches anterodorsally nearly to the level of seta L_1 .

Spermathecae (fig. 12): The spermatheca (length $30\ \mu$) has a stout duct fusing at an angle onto the neck portion. The slightly bulged neck portion, with the lips in its centre, continues smoothly into the narrowed shank which, after a slight bend, diverges to form a trumpet.

Chelicerae (fig. 10): The fixed digit (length $28\ \mu$) of the chelicerae has three teeth and a pilus dentilis. The movable digit (length $26\ \mu$) bears one to two denticles.

Legs: Leg IV bears three macrosetae, the length of the one on the genu being $42\text{--}44\ \mu$, on the tibia $38\text{--}40\ \mu$ and on the basitarsus $55\text{--}58\ \mu$. The other legs are normal.

MALE: Unknown.

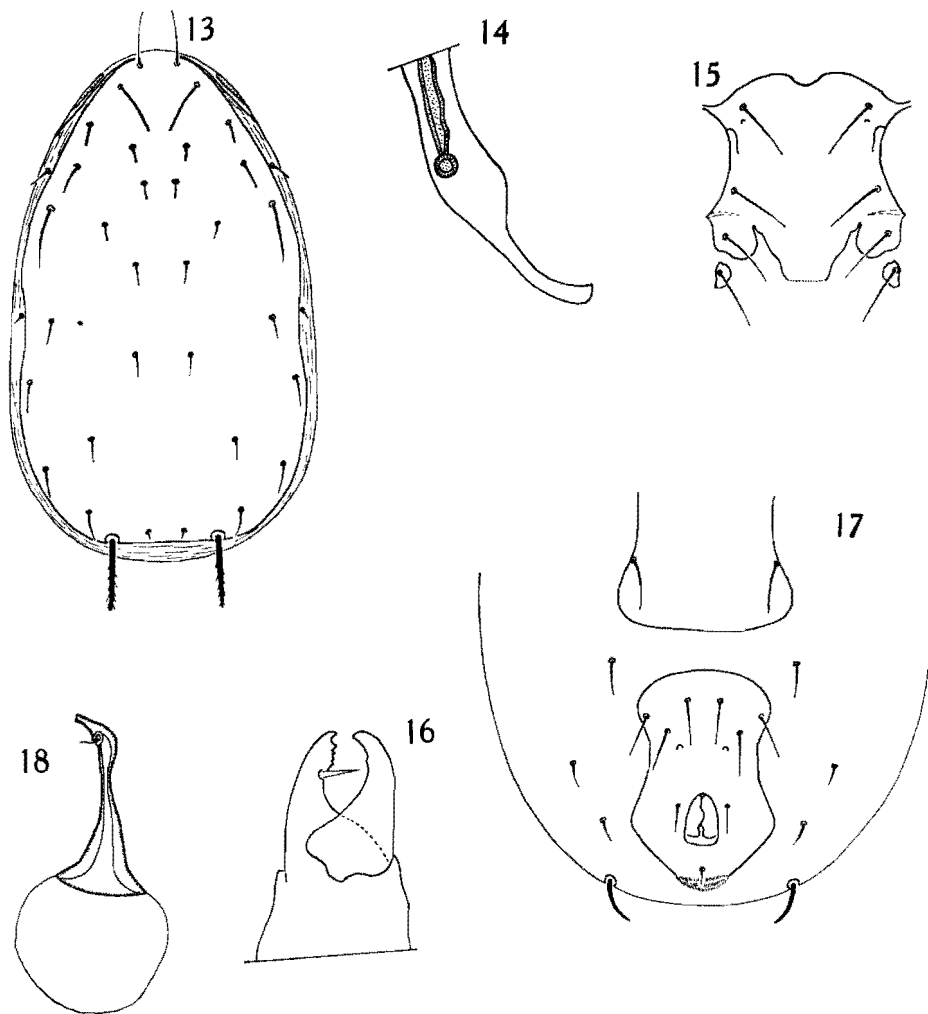
REMARKS: This species bears a superficial resemblance to *A. (T.) concordis* (Chant). They can, however, easily be separated on the basis of the absence of S_2 in *concordis* as well as the different distribution pattern of the four pairs of setae on the ventri-anal shield.

MATERIAL STUDIED: ♀ - Holotype (serial no. 38/8/58/1) and two ♀ - paratypes from leaves of *Rubus* species Grabouw (C.P.), 2.1.1955 (P. A. J. Ryke).

A. (Typhlodromalus) annecki spec. nov. figs. 13-18

This species differs from other species of the genus in that L_8 , the longest seta on the dorsum, is longer than L_4 and seta L_1 equals D_1 in length while seta D_1 is shorter than L_4 . The posterior margin of the median lobe of the sternal shield is probably straight and the lateral lobe is slightly bulged opposite the third sternal seta.

FEMALE: *Dorsum* (fig. 13): The mildly imbricate shield (length, $368\text{--}373\ \mu$; breadth, $221\text{--}224\ \mu$) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , $36\text{--}39\ \mu$; D_2 , $9\text{--}10\ \mu$; D_4 , $13\text{--}14\ \mu$; D_5 , $15\text{--}16\ \mu$; D_6 , $8\ \mu$; M_1 , $9\text{--}10\ \mu$; M_2 , $16\text{--}17\ \mu$; M_3 , $15\text{--}17\ \mu$; L_1 , $36\text{--}39\ \mu$; L_2 , $13\text{--}14\ \mu$; L_3 , $20\text{--}21\ \mu$; L_4 , $41\text{--}45\ \mu$; L_5 , $19\text{--}21\ \mu$; L_6 , $19\text{--}21\ \mu$; L_7 , $19\text{--}21\ \mu$; L_8 , $52\text{--}55\ \mu$. Setae D_1 and L_1 are of equal length. Setae D_2 , D_3 and M_1 are equal in length. Setae D_4 and L_2 are equal in length and so are D_5 , M_2 and M_3 and also L_3 , L_5 , L_6 and L_7 . Setae



Figs. 13-18. *A. (Typhlodromalus) anneckei* spec. nov., female

Fig. 13. dorsum; fig. 14. peritrematal shield; fig. 15. sternal shield; fig. 16. chelicera; fig. 17. posterior venter; fig. 18. spermatheca.

L_1 and L_4 are longer than the distances between L_1 and L_2 , and L_4 and L_3 respectively. Seta L_7 is slightly shorter than the distance between L_7 and L_3 but setae L_2 and L_3 are much shorter than the distances between L_2 and L_3 , and L_3 and L_4 respectively. The stout and slightly pectinate setae L_8 are much shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies slightly anterior to M_2 .

Venter: The sternal shield (fig. 15) (length $86-90\ \mu$; breadth $72-74\ \mu$) bears three pairs of setae. The posterior margin of the median lobe is probably straight. The lateral lobe is slightly bulged opposite the third sternal seta. The end of the incision is very narrow. Sternal setae IV are situated on irregular oval metasternal shields. The genital shield (fig. 17) is normal (width $92-95\ \mu$) and provided with a pair of setae. The ventri-anal shield (fig. 17), which is much longer than broad ($112-114\ \mu$ by $78-80\ \mu$) has a smooth rounded anterior margin and constricted lateral margins, leaving the broadest part of the shield across the anus. Three pairs of pre-anal setae and a pair of pores are grouped anteriorly on the shield. The anal portion bears three para-anal setae.

The ventral interscutal membrane, flanking the ventri-anal shield, is provided with four pairs of setae, one pair (VL_1) being long ($28-32\ \mu$) and curved. Metapodal shields are absent. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 13) and curve posteriorly around coxae IV, ending bluntly (fig. 14). Anterodorsally the peritreme reaches to a position approximately at the level of seta L_1 .

Spermathecae (fig. 18): The spermatheca measures $35\ \mu$ in length. The relatively short straight duct continues smoothly with an angle into the evenly bulged neck portion. The small lips are close to the position of the duct. The shank is constricted and its outer margins diverge moderately to form a trumpet.

Chelicerae (fig. 16): The fixed digit (length $32\ \mu$) of the chelicera bear one prominent tooth, three denticles and a pilus dentilis. The movable digit (length $32\ \mu$) is provided with one denticle.

Legs: Leg IV bears three macrosetae, the length of the one on the genu measuring $42\ \mu$, on the tibia $36-39\ \mu$ and on the basitarsus $53-58\ \mu$.

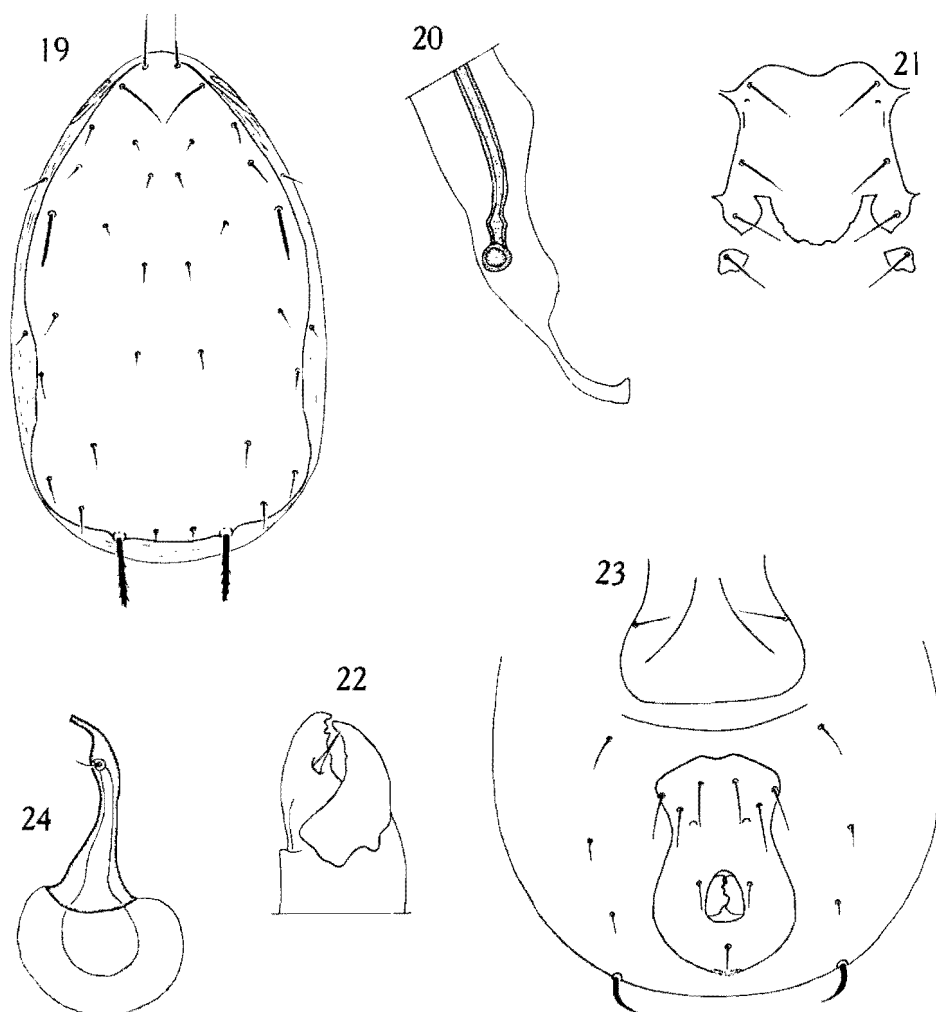
MALE: Unknown.

REMARKS: This species is near *A. (T.) rubicolus*. It differs from the latter species in that L_1 and D_1 are equal in length, the ventri-anal shield has a rounded anterior margin and the metapodal shields are absent.

MATERIAL STUDIED: ♀ - Holotype (serial no. 1/1/62) and four ♀ - paratypes from leaves of *Quercus* species, Grabouw (C.P.), 2.I.1955 (P. A. J. Ryke).

A. (Typhlodromalus) raptor spec. nov., figs. 19-24

This species differs from other members of the genus in that seta L_8 , the longest seta on the dorsum, is longer than setae L_4 , D_1 and L_1 , which are equal in length. The posterior margin of the median lobe of the sternal shield has an irregular outline and the lateral lobe has a sharp projection posteriorly.



Figs. 19-24. *A. (Typhlodromalus) raptor* spec. nov., female

Fig. 19, dorsum; fig. 20, peritrematal shield; fig. 21, sternal shield; fig. 22, chelicera; fig. 23, posterior venter; fig. 24, spermatheca.

FEMALE: Dorsum (fig. 19). The mildly imbricate shield (length 368-388 μ ; breadth 216-228 μ) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D₁, 39-41 μ ; D₂, 9-10 μ ; D₃, 9-10 μ ; D₄, 14-16 μ ; D₅, 14-16 μ ; D₆, 6-8 μ ; M₁, 9-10 μ ; M₂, 14-16 μ ; M₃, 16-19 μ ; L₁, 39-41 μ ; L₂, 13-14 μ ; L₃, 18-20 μ ; L₄, 39-41 μ ;

L_5 , 16-19 μ ; L_6 , 16-19 μ ; L_7 , 16-19 μ ; L_8 , 55-58 μ . Seta L_1 is as long as the distance between its base and that of L_2 . The stout seta L_4 is nearly as long as the distance between the bases of setae L_4 and L_3 . Setae L_2 , L_3 and L_7 are much shorter than the distance between L_2 and L_3 , L_3 and L_4 , and L_7 and L_8 respectively. Setae D_1 , L_1 and L_4 are equal in length. Setae D_2 , D_3 and M_1 are equal in length. Setae D_4 , D_5 , and M_2 are equal in length and so are M_3 , L_5 , L_6 and L_7 . The stout and slightly pectinate setae L_8 are shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies posterior to M_2 .

Venter: The sternal shield (fig. 21) (length 80-86 μ ; breadth 73-76 μ) bears three pairs of setae. The posterior margin of the median lobe has an irregular outline. The lateral lobe has a sharp projection posteriorly. The incision cuts in on the lateral lobe at a sharp angle. Sternal setae IV are situated on irregularly shaped metasternal shields. The genital shield (fig. 23) is normal (width 94-98 μ) and provided with a pair of setae.

The ventri-anal shield (fig. 23) which is much longer (109-114 μ) than broad (77-83 μ) has a rounded anterior margin, with a median anterior indentation. The lateral margins are constricted, leaving the broadest part across the anus. The posterior margin is smoothly rounded. The three pairs of pre-anal setae are anteriorly grouped with a pair of pores. The normal three para-anal setae are present.

The ventral interscutal membrane flanking the ventri-anal shield is provided with four pairs of setae one pair (VL_1) being long (30-34 μ) and curved. Metapodal shields are probably absent. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 19) and curve posteriorly around coxae IV (fig. 20), with broad blunt ends. Anterodorsally the peritremes reach to a position near the level of setae L_1 .

Spermathecae (fig. 24): The spermatheca is of moderate length (38 μ) and rather stout. The straight duct forms a blunt angle where it meets the bulged elongated oval neck portion. The small lips are situated in the centre of the neck portion. The shank is lightly constricted and its lateral margins diverge gradually to form a somewhat flared trumpet.

Chelicerae (fig. 22): The fixed digit (length 26 μ) of the chelicera is provided with two prominent teeth and one to two small denticles, and a pilus dentilis. The movable digit (length, 26 μ) bears two barely detectable denticles.

Legs: Leg IV bears three macrosetae, the one on the genu being 43-46 μ in length, on the tibia 36-39 μ and on the basitarsus 55-58 μ . The other legs are normal.

MALE: Unknown.

REMARKS: This species resembles *A. (T.) mesembrinus* (Dean) but can readily be separated from the latter by the following: D_1 , L_1 and L_4 are equal

in length and are much longer than L_3 . The ventri-anal shield has a median anterior indentation.

MATERIAL STUDIED: ♀ - Holotype (serial no. 33/13/58/1 and four ♀ - paratypes from leaves of *Passiflora* species, Grabouw (C.P.), 17.XI.1953 (P. A. J. Ryke).

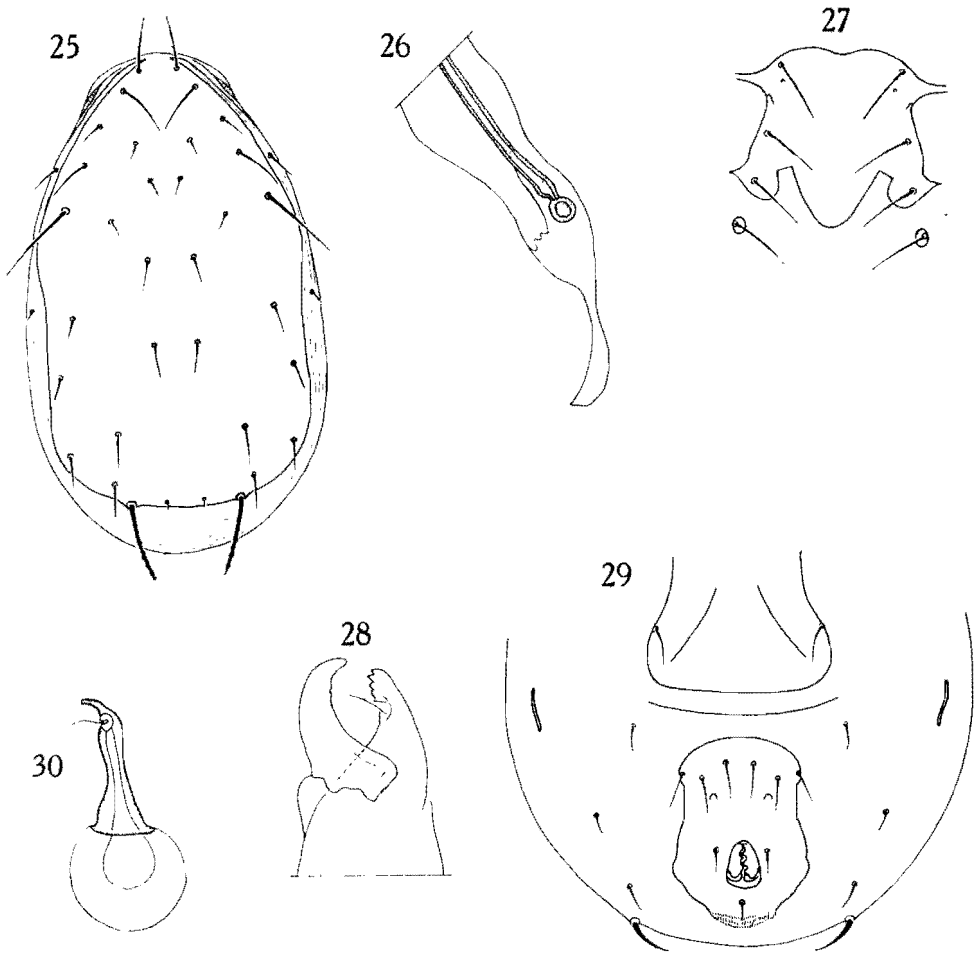
A. (Typhlodromalus) citri spec. nov., figs. 25-30

This species differs from other members of the genus in that seta L_4 is longer than L_8 and setae D_1 and L_1 are equal in length. The posterior outlines of the hind margins of the median and lateral lobes of the sternal shield are smooth and the incisions are rather wide.

FEMALE: Dorsum (fig. 25): The mildly imbricate shield (length 348-354 μ) breadth 214-220 μ) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , 40-42 μ ; D_2 , 10-13 μ ; D_3 , 10-13 μ ; D_4 , 20-23 μ ; D_5 , 20-23 μ ; D_6 , 9 μ ; M_1 , 10-13 μ ; M_2 , 20-22 μ ; M_3 , 26-28 μ ; L_1 , 39-41 μ ; L_2 , 18-20 μ ; L_3 , 33-36 μ ; L_4 , 62-66 μ ; L_5 , 23-25 μ ; L_6 , 23-25 μ ; L_7 , 23-25 μ ; L_8 , 58-60 μ . Setae L_1 , L_4 and L_7 are distinctly longer than the distance between the bases of L_1 and L_2 , L_4 and L_3 , and L_7 and L_8 respectively. L_3 are nearly as long as the distance between L_3 and L_4 . Setae D_1 and L_1 are of approximately equal length. Setae D_2 , D_3 and M_1 are equal in length. Setae D_4 , D_5 and M_2 are also equal in length, as are L_5 and L_7 . The stout setae L_8 are slightly pectinate and much shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies a little anterior to M_2 .

Venter: The sternal shield (fig. 27) (length 80-85 μ ; breadth 72-77 μ) bears three pairs of setae. Posteriorly the median and lateral lobes are smooth and the incisions are rather wide and angular. Sternal setae IV are situated on small round metasternal shields. The genital shield (fig. 29) is normal (width 96-100 μ) and provided with one pair of setae. The ventri-anal shield (fig. 29) which is much longer (105-114 μ) than broad (70-74 μ) has a rounded anterior margin; the lateral margins run parallel posteriorly for a short distance and then diverge to the broadest region across the anus. The shield bears three pairs of pre-anal setae and a pair of pores. The normal three para-anal setae are present. The ventral interscutal membrane flanking the ventri-anal shield is provided with four pairs of setae, one pair (VL_1) being long (33-35 μ) and curved. One pair of slender metapodal shields is present. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 25) and curve posteriorly around coxae IV (fig. 26), ending in a sharp point. The peritremes reach dorsally to a position close to the level of setae L_1 .

Spermathecae (fig. 30): The stout, short spermatheca measures 30 μ in length. The curved duct forms an angle with the slightly and evenly bulged



Figs. 25-30. *A. (Typhlodromalus) citri* spec. nov., female

Fig. 25, dorsum; fig. 26, peritrematal shield; fig. 27, sternal shield; fig. 28, chelicera; fig. 29, posterior venter; fig. 30, spermatheca.

neck portion; the prominent lips are placed almost where the duct meets the neck portion. The shank diverges slightly towards its flared distal end.

Chelicerae (fig. 28): The fixed digit (length $29\ \mu$) of the chelicera bears one to two prominent teeth, one to two smaller ones and a pilus dentilis. The movable digit (length $29\ \mu$) bears one or two denticles.

Legs: Leg IV is provided with three macrosetae, the length of the one on

the genu being 52-58 μ , and the tibia 38-43 μ and on the basitarsus 52-58 μ . The seta on the tibia is blunt. The other legs are normal.

MALE: Unknown.

REMARKS: This species is near *A. (T.) scutalis* (Athias-Henriot) but differs from it in the shape of the ventri-anal shield and the relative lengths of D_1 , L_1 and L_3 .

MATERIAL STUDIED: ♀ - Holotype (serial no. 2/1/62) and four ♀ - paratypes from the leaves of *Citrus* species, Rustenburg (Tvl.), 29.XI.1961 (G. G. van der Merwe).

A. (Typhlodromalus) addoensis, spec. nov., figs. 31-39

This species differs from other members of the genus in that seta L_4 is longer than L_8 and seta D_1 is shorter than L_1 , while seta L_3 is shorter than the distance between its base and that of L_4 . The posterior margin of the lateral lobe of the sternal shield is smooth.

FEMALE: *Dorsum* (fig. 31): The mildly imbricate shield (length, 355-375 μ ; breadth, 220-228 μ) is provided with 17 pairs of setae, six of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , 39-42 μ , D_2 , 9-10 μ ; D_3 , 9-10 μ , D_4 , 16-17 μ ; D_5 , 16-18 μ ; D_6 , 6-8 μ ; M_1 , 9-10 μ ; M_2 , 16-12 μ ; M_3 , 19-20 μ ; L_1 , 47-49 μ ; L_2 , 14-15 μ ; L_3 , 32-35 μ ; L_4 , 65-68 μ ; L_5 , 24-26 μ ; L_6 , 24-26 μ ; L_7 , 24-27 μ ; L_8 , 63-65 μ . Setae D_2 , D_3 , M_1 are equal in length. D_4 , D_5 and M_2 are equal in length and so are L_5 , L_6 and L_7 . Setae L_1 , L_4 and L_7 are longer than the distances between the bases of L_1 and L_2 , L_4 and L_3 and L_7 and L_8 respectively. Seta L_3 is not much shorter than the distance between its base and that of L_4 . The stout and faintly pectinate setae L_8 are shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies lateral to M_2 , at the same level.

Venter: The sternal shield (fig. 33) (length 82-88 μ ; breadth 74-76 μ) bears three pairs of setae. Posteriorly the median lobe has two slight protuberances; the lateral lobes are smooth and prominent. The incision has a sharp point towards the lateral lobe. The pair of small oval metasternal shields bears a pair of setae. The genital shield (fig. 35) is normal (width 88-92 μ) and provided with a pair of setae.

The ventri-anal shield (fig. 35) which is much longer (114-120 μ) than broad (72-76 μ) has a smooth anterior margin. The lateral margins are slightly irregularly constricted, diverging suddenly to the broadest part across the anus. The posterior margin is also slightly irregular. Three pairs of pre-anal setae and a pair of pores are anteriorly grouped. The normal three para-anal setae are present.

The ventral interscutal membrane flanking the ventri-anal shield is provided

with four pairs of setae, one pair (VL_1) being long ($40-50\ \mu$) and slightly curved. The membrane is also provided with two pairs of metapodal plates, the primary one being long and slender. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 31) and curve posteriorly around coxae IV (fig. 32), each ending in an obtuse angle. The peritreme reaches anterodorsally to a position at the level of seta L_1 .

Spermathecae (fig. 36): The slender spermatheca measures $38\ \mu$ in length and has a straight duct. It runs straight into the neck portion. The lips are positioned in the centre of the neck portion which is only slightly bulged opposite the lips. The lateral margins of the shank run nearly parallel, diverging gradually to form a narrow trumpet.

Chelicerae (fig. 34): The fixed digit (length $22\ \mu$) of the chelicera bears four teeth and one or two small denticles and a pilus dentilis. The movable digit (length $22\ \mu$) is devoid of teeth.

Legs: Leg IV is provided with three macrosetae, the length of the one on the genu being $55-58\ \mu$, on the tibia $42-45\ \mu$ and on the basitarsus $62-66\ \mu$. The other legs are normal.

MALE: Dorsum: The mildly imbricate shield measures $274-284\ \mu$ by $172-178\ \mu$ and the chaetotaxy resembles that of the female. The lengths of the setae are as follows: D_1 , $36-38\ \mu$; D_2 , $9-10\ \mu$; D_3 , $9-10\ \mu$; D_4 , $14-15\ \mu$; D_5 , $16-17\ \mu$; D_6 , $6\ \mu$; M_1 , $9-10\ \mu$; M_2 , $16-17\ \mu$; M_3 , $18-19\ \mu$; L_1 , $43-45\ \mu$; L_2 , $16-17\ \mu$; L_3 , $31-32\ \mu$; L_4 , $51-53\ \mu$; L_5 , $21-23\ \mu$; L_6 , $21-23\ \mu$; L_7 , $21-23\ \mu$; L_8 , $48-50\ \mu$. The relative lengths of the setae differ from those of the female in that seta L_3 is longer than the distance between its base and that of L_4 . Setae S_1 and S_2 are placed on the dorsal shield (fig. 38).

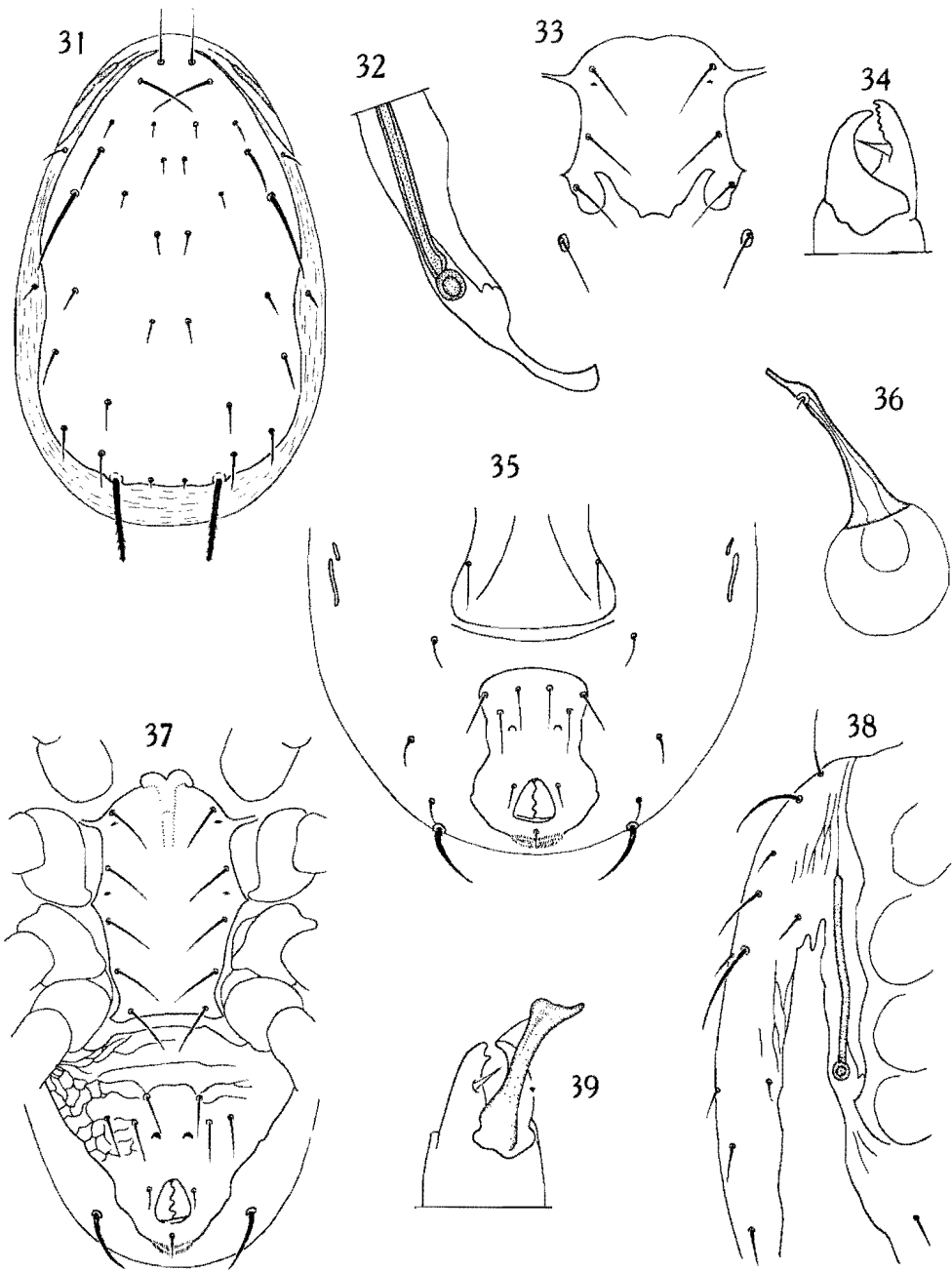
Venter: The sternal shield (fig. 37) is longer than wide and bears five pairs of setae, with the genital opening on its anterior margin. The ventri-anal shield, provided with three pairs of pre-anal setae and a pair of pores, fuses laterally with the peritrematal shields. The para-anal setae are normal. The ventral interscutal membrane bears only one pair of setae (VL_1). The peritrematal shields (fig. 38) are fused anterodorsally with the dorsal shield at a position near the level of S_1 . The peritreme reaches anteriorly to a position between the levels of setae L_2 and L_3 .

Chelicerae (fig. 39): The fixed digit of the chelicera bears one prominent tooth and a pilus dentilis. The movable digit is devoid of teeth and bears a well developed, footshaped, spermatophoral process.

EXPLANATIONS OF FIGURES

Figs. 31-39. *A. (Typhlodromalus) addoensis* spec. nov.

Fig. 31. dorsum; fig. 32. peritrematal shield, female; fig. 33. sternal shield, female; fig. 34. chelicera, female; fig. 35. posterior venter, female; fig. 36. spermatheca; fig. 37. venter, male; fig. 38. lateral view, male; fig. 39. chelicera, male.



Legs: Leg IV is provided with three macrosetae, the one on the genu being $39\text{--}43\ \mu$ long, on the tibia $33\text{--}37\ \mu$ and on the basitarsus $48\text{--}52\ \mu$. The other legs are normal.

REMARKS: This species resembles *A. (T.) hibisci* (Chant) but can be separated from the latter by the fact that L_2 is much shorter than L_3 , M_2 is longer than half the length of L_5 , and the ventri-anal shield is not oval-shaped.

MATERIAL STUDIED: ♀ - Holotype (serial no. 3/1/62), ♂ - allotype, six ♀ - and one ♂ - paratypes from leaves of *Vitis* species, Addo (C.P.) 20.III.1961 (G. G. van der Merwe).

A. (Typhlodromalus) undulatus spec. nov., figs. 40-48

This species differs from other members of the genus in that seta L_4 is longer than L_8 and seta D_1 shorter than L_1 , while seta L_3 is as long as the distance between its base and that of seta L_4 . The posterior margin of the lateral lobe of the sternal shield is undulate.

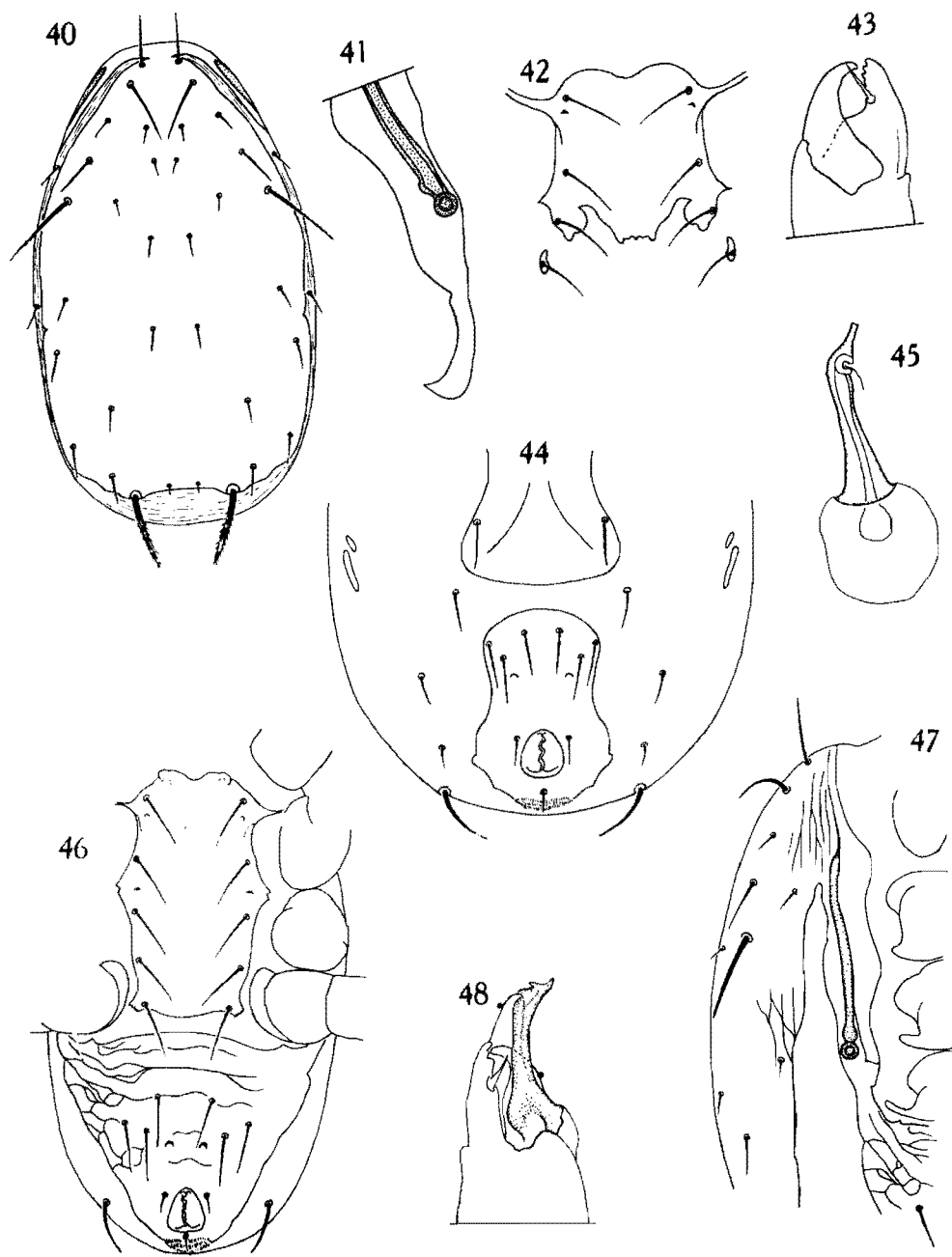
FEMALE: Dorsum (fig. 40): The mildly imbricate shield (length $350\text{--}362\ \mu$; breadth $215\text{--}228\ \mu$) is provided with 17 pairs of setae, six pairs of which are placed in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , $37\text{--}39\ \mu$; D_2 , $9\text{--}11\ \mu$; D_3 , $9\text{--}11\ \mu$; D_4 , $14\text{--}15\ \mu$; D_5 , $16\text{--}17\ \mu$; D_6 , $6\ \mu$; M_1 , $9\text{--}11\ \mu$; M_2 , $16\text{--}17\ \mu$; M_3 , $18\text{--}20\ \mu$; L_1 , $45\text{--}48\ \mu$; L_2 , $14\text{--}15\ \mu$; L_3 , $32\text{--}34\ \mu$; L_4 , $61\text{--}64\ \mu$; L_5 , $21\text{--}23\ \mu$; L_6 , $22\text{--}24\ \mu$; L_7 , $21\text{--}23\ \mu$; L_8 , $55\text{--}58\ \mu$. Setae D_2 , D_3 and M_1 are equal in length. Setae D_4 and L_2 are equal in length and so are setae D_5 and M_2 . Setae L_5 , L_6 and L_7 are approximately equal in length and a little longer than seta M_3 . Setae L_1 , L_4 and L_7 are longer than the distances between the bases of setae L_1 and L_2 , L_4 and L_3 , and L_7 and L_8 respectively. Setae L_3 is as long or nearly as long, as the distance between the bases of setae L_3 and L_4 , but seta L_2 is much shorter than the distance between the bases of setae L_2 and L_3 . The stout and slightly pectinate setae L_8 are shorter than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane, with seta S_2 slightly posterior to the level of seta M_2 .

Venter: The sternal shield (fig. 42) (length $80\text{--}84\ \mu$; breadth $73\text{--}76\ \mu$) bears three pairs of setae. The posterior margin of the median lobe is irregular with two projections laterally. The lateral lobe is undulate posteriorly and the incision has a sharp point towards the lateral lobe. Sternal setae IV are

EXPLANATIONS OF FIGURES

Figs. 40-48. *A. (Typhlodromalus) undulatus* spec. nov.

Fig. 40. dorsum; fig. 41. peritrematal shield, female; fig. 42. sternal shield, female; fig. 43. chelicera, female; fig. 44. posterior venter, female; fig. 45. spermatheca; fig. 46. venter, male; fig. 47. lateral view, male; fig. 48. chelicera, male.



situated on semicircular metasternal shields. The genital shield (fig. 44) is normal (width $88\text{--}92\ \mu$) and provided with a pair of setae.

The ventri-anal shield (fig. 44), which is much longer ($103\text{--}109\ \mu$) than broad ($66\text{--}69\ \mu$), has a rounded anterior margin and slightly constricted lateral margins, which diverge suddenly towards the broadest part across the anus. The posterior margin is round and slightly irregular. The three pairs of pre-anal setae and a pair of pores are anteriorly grouped on the shield. The three para-anal setae are normal.

The ventral interscutal membrane flanking the ventrianal shield is provided with four pairs of setae, one pair (VL_1) being long ($35\text{--}40\ \mu$) and slightly curved. Two pairs of metapodal shields are present, the primary ones being slender and approximately three times the length of the smaller anterior ones. The peritrematal shields fuse antero-dorsally with the dorsal shield (fig. 40) and curve posteriorly around coxae IV (fig. 41), ending broadly with a sharp point medially. The peritreme reaches anterodorsally beyond the level of seta L_1 .

Spermathecae (fig. 45): The rather stout spermatheca measures $36\ \mu$ in length. The straight prominent duct continues into a smoothly bulged neck portion. The big lips lie a short distance from the centre of the neck portion towards the position of the duct. The shank is very slightly constricted, its outer margins running more or less parallel to the distal end where it is slightly flared.

Chelicerae (fig. 43): The fixed digit (length $26\ \mu$) of the chelicera is provided with two to three teeth and a pilus dentilis. The movable digit (length $26\ \mu$) is devoid of teeth.

Legs: Leg IV bears three macrosetae, the length of the one on the genu being $52\text{--}55\ \mu$, on the tibia $38\text{--}40\ \mu$ and on the basitarsus $58\text{--}62\ \mu$. The other legs are normal.

MALE: Dorsum: The imbricate dorsal shield measures $273\text{--}282\ \mu$ by $155\text{--}161\ \mu$ and the chaetotaxy resembles that of the female. The lengths of the setae are as follows: D_1 , $33\text{--}35\ \mu$; D_2 , $9\text{--}10\ \mu$; D_3 , $9\text{--}10\ \mu$; D_4 , $14\text{--}15\ \mu$; D_5 , $15\text{--}16\ \mu$; D_6 , $6\text{--}7\ \mu$; M_1 , $9\text{--}10\ \mu$; M_2 , $14\text{--}15\ \mu$; M_3 , $17\text{--}18\ \mu$; L_1 , $36\text{--}39\ \mu$; L_2 , $15\text{--}16\ \mu$; L_3 , $29\text{--}32\ \mu$; L_4 , $46\text{--}49\ \mu$; L_5 , $21\text{--}22\ \mu$; L_6 , $22\text{--}23\ \mu$; L_7 , $22\text{--}23\ \mu$; L_8 , $46\text{--}49\ \mu$. The relative lengths of the setae differ from those of the female in that setae L_4 and L_8 are of equal length. Setae S_1 and S_2 are placed on the dorsal shield (fig. 47) with S_1 on the same level as L_3 and seta S_2 decidedly anterior to M_2 .

Venter: The sternal shield (fig. 46) is much longer than wide and bears five pairs of setae with the genital opening on the anterior margin. The imbricate ventri-anal shield (fig. 46), provided with three pairs of pre-anal setae and a pair of pores, fuses anterolaterally with the peritrematal shields. The anterior margin of the ventri-anal shield is slightly convex but for a sharp projection where it fuses laterally with the peritrematal shield. The tapering

lateral margins are irregular. The para-anal setae are normal. The ventral interscutal membrane flanking the ventri-anal shield bears only one pair of setae (VL₁). The peritrematal shields (fig. 47) are fused with the dorsal shield. The peritreme reaches anteriorly to a position near the level of seta L₂.

Chelicerae (fig. 48): The fixed digit (length 21 μ) of the chelicera bears two teeth and a pilus dentilis. The movable digit (length 21 μ) is devoid of teeth and bears the spermatophoral process (length 32 μ) which has two hooks on its distal margin.

Legs: Leg IV bears three macrosetae, the one on the genu being 40-43 μ long, on the tibia 35-37 μ and on the basitarsus 49-52 μ . The other legs are normal.

REMARKS: This species is probably closely related to *A. (T.) addoensis*. It differs from *addoensis* in that L₃ is as long as the distance between the bases of L₃ and L₄, the posterior margin of the lateral lobe of the sternal shield is undulate, and the lateral margins of the ventri-anal shield are smoothly constricted.

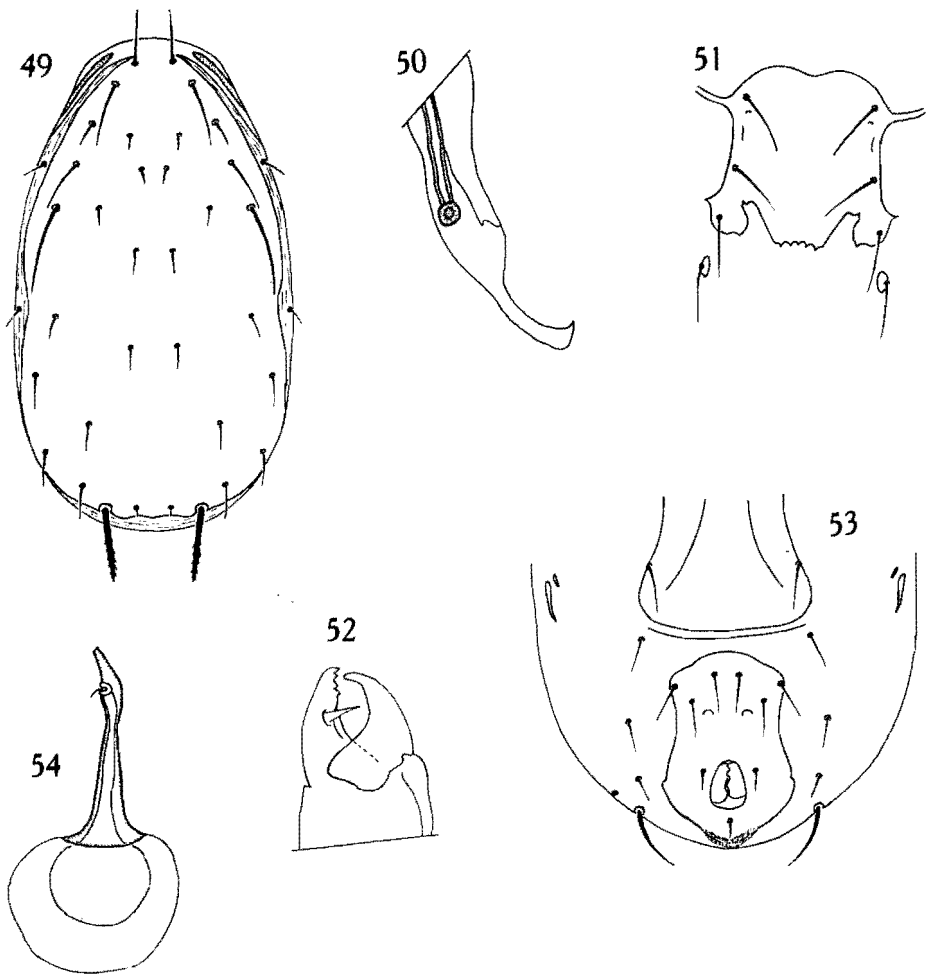
MATERIAL STUDIED: ♀·Holotype (serial no. 4/1/62), ♂·allotype, four ♀· and one ♂·paratypes from the leaves of *Quercus* species, Addo (C.P.), 20.III. 1961 (G. G. van der Merwe).

A. (Typhlodromalus) capensis spec. nov., figs. 49-54

This species differs from other members of the genus in that seta L₄ is longer than L₈ and seta D₁ shorter than L₁, while seta L₃ is greater in length and seta L₂ shorter than the distance between the bases of setae L₃ and L₄, and L₂ and L₃ respectively. The posterior margin of the median lobe of the sternal shield is serrated.

FEMALE: *Dorsum* (fig. 49): The mildly imbricate dorsal shield (length 362-375 μ ; breadth 209-220 μ) is provided with 17 pairs of setae, six in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D₁, 38-40 μ ; D₂, 9-11 μ ; D₃, 9-11 μ ; D₄, 16-17 μ ; D₅, 16-17 μ ; D₆, 6-8 μ ; M₁, 9-11 μ ; M₂, 16-17 μ ; M₃, 19-20 μ ; L₁, 47-51 μ ; L₂, 16-18 μ ; L₃, 37-40 μ ; L₄, 65-68 μ ; L₅, 23-24 μ ; L₇, 23-24 μ ; L₈, 58-61 μ . Setae D₁ and L₃ are approximately equal in length. Setae D₂, D₃ and M₁ are of equal length. Setae D₄, D₅, M₂ and L₂ are of equal length and so are L₅, L₆ and L₇. Setae L₁, L₃, L₄ and L₇ are longer than the distances between setae L₁ and L₂, L₃ and L₄, L₄ and L₃, and L₇ and L₈ respectively. The stout and faintly pectinate setae L₈ are shorter than the distance between their bases. Setae S₁ and S₂ are placed on the interscutal membrane.

Venter: The sternal shield (fig. 51) (length 85-87 μ , breadth 71-74 μ) bears three pairs of setae. The posterior margin of the median lobe is serrated and the lateral lobe is slightly irregular. The incision is broad and angular,



Figs. 49-54. *A. (Typhlodromalus) capensis* spec. nov., female

Fig. 49, dorsum; fig. 50, peritrematal shield; fig. 51, sternal shield; fig. 52, chelicera; fig. 53, posterior venter; fig. 54, spermatheca.

having another much smaller incision near the lateral corner. Sternal setae IV are situated on small oval metasternal shields. The genital shield (fig. 53) is normal (width $88-95\mu$) and provided with a pair of setae.

The ventri-anal shield (fig. 53) which is much longer ($108-114\mu$) than broad ($71-77\mu$) has a rounded anterior margin with two slight depressions laterally. The lateral margins are slightly constricted and diverge gradually to the broadest part of the shield across the anus. Anteriorly the ventri-anal

shield bears three pairs of pre-anal setae and a pair of pores. The normal para-anal setae are present.

The ventral interscutal membrane, flanking the ventri-anal shield, is provided with four pairs of setae, one pair (VL_1) being long ($40-42\ \mu$) and slightly curved. Two pairs of metapodal plates are present, the primary ones being long and slender. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 49) and curve posteriorly around coxae IV (fig. 50), ending broadly, with a sharp point medially. The peritreme reaches anterodorsally past the level of seta L_1 , nearly to the level of seta D_1 .

Spermathecae (fig. 54): The spermatheca is of moderate length ($36\ \mu$). The stout duct runs straight and smoothly into the bulged neck portion. The lips are situated in a position close to the duct. The constricted lateral margins of the shank diverge slightly towards the distal end where it is flared, forming a narrow trumpet.

Chelicerae (fig. 52): The fixed digit (length $23\ \mu$) of the chelicera is provided with three teeth and a pilus dentilis. The movable digit (length $23\ \mu$) is devoid of teeth.

Legs: Leg IV bears three macrosetae, the length of the one on the genu being $55-56\ \mu$, on the tibia $42-43\ \mu$ and on the basitarsus $61-63\ \mu$. The other legs are normal.

MALE: Unknown.

REMARKS: This species is near *A. (T.) planetarius* (De Leon) but the shape of the ventri-anal shield differs in that species; also L_4 is longer than L_8 and L_2 is much shorter than L_3 in *capensis*.

MATERIAL STUDIED: ♀ - Holotype (serial no. 5/1/62) and three ♀ - paratypes from leaves of *Betula* species, Addo (C.P.), 20.III.1961 (G. G. van der Merwe).

A. (Typhlodromalus) erugatus spec. nov., figs. 55-63

This species differs from other members of the genus in that seta L_4 is longer than L_8 and seta D_1 is shorter than L_1 . Setae L_3 and L_2 are greater in length, and seta D_2 shorter, than the distances between bases L_3 and L_4 , L_2 and L_3 , and D_2 and D_3 respectively. The median and lateral lobes of the sternal shield are smoothly rounded.

FEMALE: *dorsum* (fig. 55): The mildly imbricate shield (length $375-388\ \mu$; breadth $214-220\ \mu$) is provided with 17 pairs of setae, six in the dorsal (D), three in the median (M) and eight in the lateral (L) series. The lengths of these setae are as follows: D_1 , $42-45\ \mu$; D_2 , $13-14\ \mu$; D_3 , $13-14\ \mu$; D_4 , $19-21\ \mu$; D_5 , $22-23\ \mu$; D_6 , $7-9\ \mu$; M_1 , $13-14\ \mu$; M_2 , $22-23\ \mu$; M_3 , $26-29\ \mu$; L_1 , $46-49\ \mu$; L_2 , $33-36\ \mu$; L_3 , $51-55\ \mu$; L_4 , $69-72\ \mu$; L_5 , $26-29\ \mu$; L_6 , $26-29\ \mu$; L_7 , $26-29\ \mu$; L_8 , $65-68\ \mu$. Setae D_2 , D_3 , and M_1 are equal in length, as are setae D_5 and M_2 and setae M_3 , L_5 , L_6 and L_7 . Setae D_4 are slightly shorter

than D_5 and M_2 . Setae L_1 , L_2 and L_7 are each longer than the distance between their bases and the bases of the next setae in the lateral series. Seta L_4 is longer than the distance between the bases of L_4 and L_3 and even longer than that between the bases of L_4 and L_2 . The stout needle-shaped setae L_8 are very faintly and sparsely pectinate. Setae S_1 and S_2 are placed on the interscutal membrane. Seta S_2 lies anterior to the level of seta M_2 .

Venter: The sternal shield (fig. 57) (length $90-95\ \mu$; breadth $72-75\ \mu$) bears three pairs of setae. The median and lateral lobes are smoothly rounded and the incision squarely cut. Sternal setae IV are situated on the posterior margin of small oval mestasternal shields. The genital shield (fig. 59) is normal (width $95-100\ \mu$) and provided with a pair of setae.

The ventri-anal shield (fig. 59) which is longer ($108-114\ \mu$) than broad ($75-79\ \mu$) has a flattened round anterior margin (in some specimens the lateral part is depressed) and constricted lateral margins which diverge to the broadest part across the anus. Three pairs of pre-anal setae are anteriorly grouped with a pair of pores. The normal three para-anal setae are present.

The ventral interscutal membrane flanking the ventri-anal shield is provided with four pairs of setae, one pair (VL_1) being long ($44\ \mu$) and curved. A pair of slender metapodal plates is present. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 55) and curve posteriorly around coxae IV (fig. 56), ending bluntly. The peritreme reaches anterodorsally past the level of seta L_1 .

Spermathecae (fig. 60): The stout spermatheca (length $30\ \mu$) has a prominent duct, running straight into the slightly bulged neck portion. The big lips are rather close to the position of the duct. The lateral margins of the shank are slightly constricted, diverging distally to form a trumpet.

Chelicerae (fig. 58): The fixed digit (length $26\ \mu$) of the chelicera is provided with two prominent blunt teeth and a pilus dentilis. The movable digit (length $26\ \mu$) has a denticulate inner distal margin.

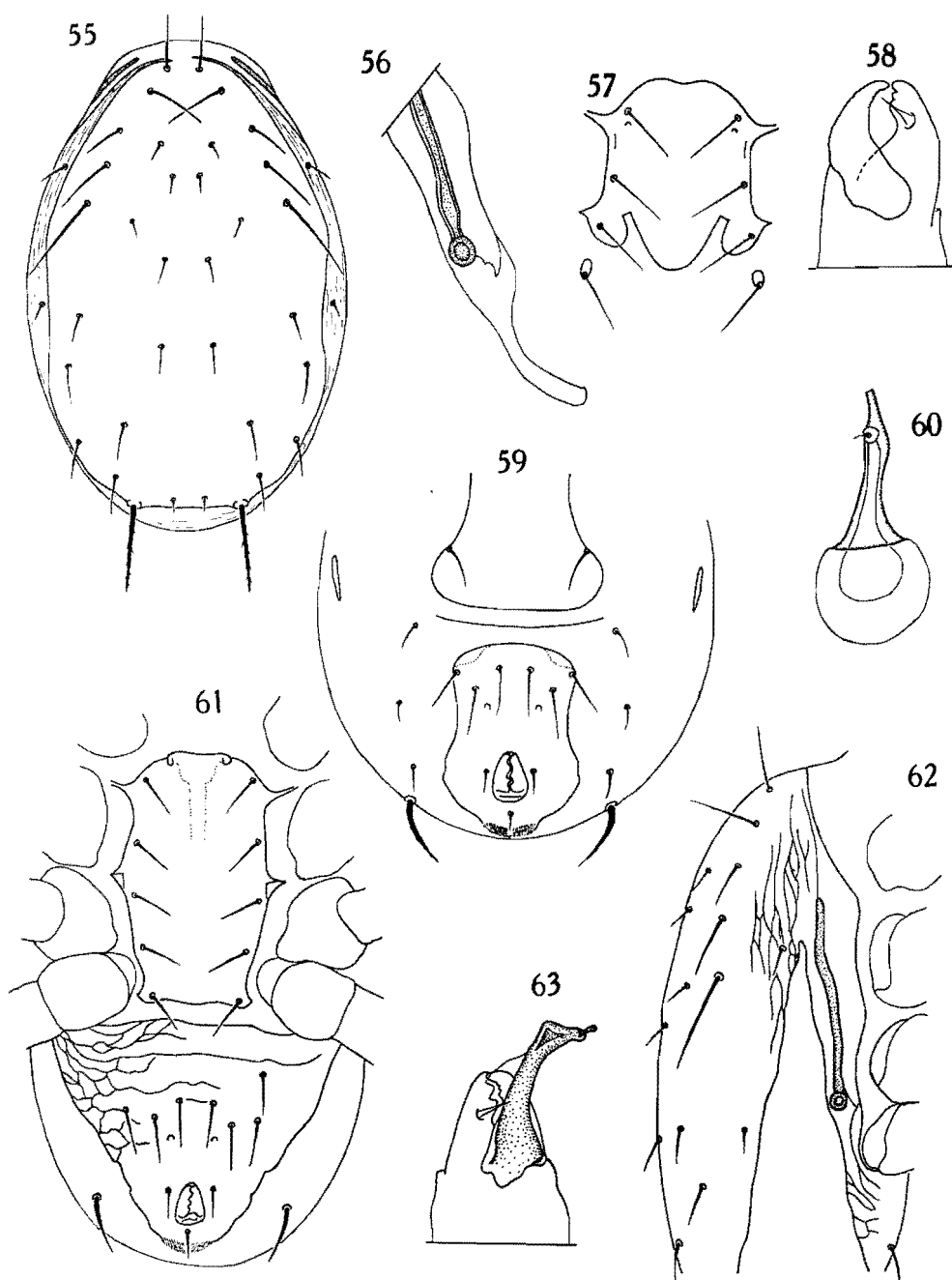
Legs: Leg IV bears three macrosetae, the length of the one on the genu being $58-60\ \mu$, on the tibia $45-48\ \mu$ and on the basi-tarsus $67-74\ \mu$. The other legs are normal.

MALE: Dorsum: The imbricate dorsal shield measures $282-294\ \mu$ by $174-180\ \mu$ and the chaetotaxy resembles that of the female. The lengths of the setae are as follows: D_1 , $34-38\ \mu$; D_2 , $13-14\ \mu$; D_3 , $13-14\ \mu$; D_4 , $16-19\ \mu$;

EXPLANATIONS OF FIGURES

Figs. 55-63. *A. (Typhlodromalus) erugatus* spec. nov.

Fig. 55. dorsum; fig. 56. peritrematal shield, female; fig. 57. sternal shield, female; fig. 58. chelicera, female; fig. 59. posterior venter, female; fig. 60. spermatheca; fig. 61. venter, male; fig. 62. lateral view, male; fig. 63. chelicera, male.



D₅, 19-22 μ ; D₆, 6-9 μ ; M₁, 13-14 μ ; M₂, 19-22 μ ; M₃, 24-26 μ ; L₁, 39-43 μ ; L₂, 26-29 μ ; L₃, 38-42 μ ; L₄, 54-56 μ ; L₅, 24-26 μ ; L₆, 24-26 μ ; L₇, 24-26 μ ; L₈, 51-52 μ . The relative lengths of the setae differ from those of the female in that setae L₂ are not as long as the distance between the bases of L₂ and L₃. Setae S₁ and S₂ are placed on the dorsal shield (fig. 62) with S₁ posterior to the level of L₃, and S₂ at the same level as M₂.

Venter: The sternal shield (fig. 61) is much longer than wide and bears five pairs of setae with the genital opening on the anterior margin. The imbricate ventri-anal shield (fig. 61) is provided with three pairs of pre-anal setae (one specimen has an extra pre-anal seta anteriorly) and a pair of pores, and fuses anterolaterally with the peritrematal shields. The anterior margin of the shield is nearly straight. The tapering lateral margins are irregular but have a definite pattern (fig. 61). The para-anal setae are normal. The ventral interscutal membrane, flanking the ventri-anal shield bears only one pair of setae (VL₁). The peritrematal shields (fig. 62) fuse anterodorsally, at the level of S₁, with the dorsal shield. The peritreme reaches anteriorly to a position past the level of seta L₃.

Chelicerae: (fig. 63): The fixed digit (length 22 μ) of the chelicera bears two large teeth and a pilus dentilis. The movable digit (length 22 μ) has one tooth with two or three denticles and a well defined foot-shaped spermatophoral bearer (length 36 μ) with a small appendix near its extremity.

Legs: Leg IV is provided with three macrosetae, the one on the genu being 32-35 μ long, on the tibia 38-41 μ and on the basitarsus 52-55 μ . The other legs are normal.

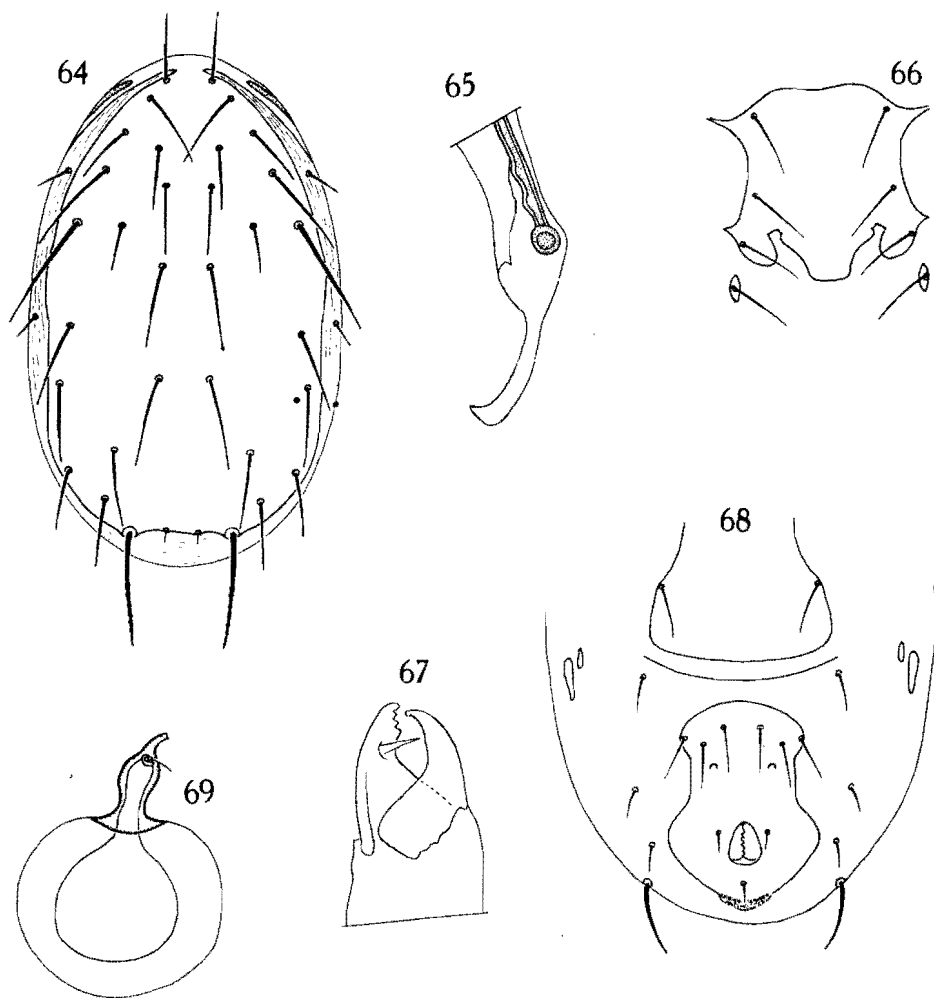
REMARKS: This species resembles *A. (T.) capensis* but can be distinguished from the latter by the following: L₁-L₄ are longer than the distances between their bases; the fixed digit of the chelicera bears only two prominent blunt teeth; the posterior margins of the median and lateral lobes are smooth.

MATERIAL STUDIED: ♀ - Holotype (serial no. 33/13/58/1), ♂ - allotype seven ♀ - and one ♂ - paratypes from leaves of *Passiflora* species, Grabouw (C.P.), 17.XI.1953 (P. A. J. Ryke).

A. (Typhlodromalus) transvaalensis spec. nov., figs. 64-69

This species differs from other members of the genus in that seta L₄ is longer than L₈ and setae D₁ shorter than L₁. Setae L₃, L₂ and D₂ are greater in length than the distances between the bases of setae L₃ and L₄, L₂ and L₃ and D₂ and D₃ respectively. The posterior margin of the median lobe of the sternal shield is straight and the lateral lobes are smooth.

FEMALE: *Dorsum* (fig. 64): The mildly imbricate dorsal shield (length 355-370 μ ; breadth 205-220 μ) is provided with 17 pairs of setae, six in the dorsal (D), three in the median (M) and eight in the lateral (L) series.



Figs. 64-69. *A. (Typhlodromalus) transvaalensis* spec. nov., female

Fig. 64. dorsum; fig. 65. peritrematal shield; fig. 66. sternal shield; fig. 67. chelicera; fig. 68. posterior venter; fig. 69. spermatheca.

The lengths of these setae are as follows: D_1 , 48-52 μ ; D_2 , 46-50 μ ; D_3 , 50-53 μ ; D_4 , 63-65 μ ; D_5 , 68-70 μ ; D_6 , 9-12 μ ; M_1 , 32-35 μ ; M_2 , 63-65 μ ; M_3 , 60-63 μ ; L_1 , 54-57 μ ; L_2 , 43-46 μ ; L_3 , 71-74 μ ; L_4 , 86-90 μ ; L_5 , 57-60 μ ; L_6 , 46-48 μ ; L_7 , 50-52 μ ; L_8 , 80-86 μ . Setae D_1 , D_3 and L_7 are of approximately equal length. Setae D_2 and L_6 are of equal length and slightly longer than seta L_2 .

Setae D_4 and M_2 are equal in length and slightly longer than seta M_3 . Setae D_2 , L_1 , L_2 , L_3 , L_4 , L_6 and L_7 are longer than the distances between the bases of setae D_2 and D_3 , L_1 and L_2 , L_2 and L_3 , L_3 and L_4 , L_4 and L_3 , L_6 and L_7 , and L_7 and L_8 respectively. Seta M_2 is longer than the distance between its base and that of seta L_5 , and the faintly pectinate setae L_8 are slightly longer than the distance between their bases. Setae S_1 and S_2 are placed on the interscutal membrane.

Venter: The sternal shield (fig. 66) (length $88.95\ \mu$; breadth $77.80\ \mu$) bears three pairs of setae. The posterior margin of the median lobe is straight and the prominent lateral lobe is smooth. The incision ends angularly, having a smaller incision in the median lobe. Sternal setae IV are situated on oval metasternal shields. The genital shield (fig. 68) is normal (width $100.106\ \mu$) and provided with a pair of setae.

The ventri-anal shield (fig. 68) is much longer ($109.144\ \mu$) than broad ($76.79\ \mu$) and has a rounded anterior margin and parallel, constricted lateral margins which diverge suddenly posteriorly so that the broadest part of the shield lies across the anus. Three pairs of pre-anal setae and a pair of pores are anteriorly grouped on the shield. The para-anal setae are normal.

The ventral interscutal membrane flanking the ventri-anal shield is provided with four pairs of setae, one pair (VL_1) being long $52.54\ \mu$ and slightly curved. Two pairs of metapodal shields are present, the primary ones being more than twice the length of the smaller ones. The peritrematal shields fuse anterodorsally with the dorsal shield (fig. 64) and curve posteriorly around coxae IV (fig. 65), ending broadly, with a sharp median point. The peritreme reaches anterodorsally to a position past the level of seta L_1 .

Spermathecae (fig. 69). The short thick spermatheca measures $20\ \mu$ in length and has a slightly curved duct. The neck portion is large and greatly bulged with the lips close to the position of the duct. The shank is sharply constricted and flares suddenly towards its ends.

Chelicerae (fig. 67): The fixed digit (length $29\ \mu$) of the chelicera bears three prominent teeth and a pilus dentilis. The movable digit (length $29\ \mu$) has a denticulate inner distal margin.

Legs: Leg IV is provided with three macrosetae, the length of the one on the genu $70.74\ \mu$, on the tibia $50.53\ \mu$ and on the basitarsus $83.86\ \mu$. The other legs are normal.

MALE: Unknown.

REMARKS: This species bears a resemblance to *A. (T.) erugatus*. It differs from *erugatus* in the relative lengths of L_5 , L_6 , L_7 , L_8 , D_2 and M_3 , and in the shape of the ventri-anal shield.

MATERIAL STUDIED: ♀ - Holotype (serial no. 6/1/62) and four ♀ - paratypes from leaves of *Musa* species, Tzaneen (Tvl.), 7.VII.1951 (M. K. P. Meyer).

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